MARSHALL STAR

Serving the Marshall Space Flight Center Community **Jan. 24, 2002**

Photo by Terry Leibold, NASA/Marshall Space Flight Center

Jeff Dysart, an employee with Ai Signal Research Inc., installs an ampoule into the breadboard furnace.

Small furnace for materials science research being developed at Marshall

by Debra Valine

Although actual flight of the Materials Science Research Rack-1 is not planned until late 2004, Marshall scientists and engineers are hard at work developing and testing a small furnace that will be crucial to materials science experiments being conducted on the International Space Station.

The Materials Science Research Rack-1 will accommodate two autonomous experiment modules — Alpha and Beta — on the International Space Station. Experiment Module Alpha will comprise a Single Crystal Growth chamber, developed at the University of Alabama in Huntsville (UAH) through the Space Product Development Program, for approximately 10 months. The Module Alpha location will then become available for other experiment modules. The Experiment Module Beta location will hold the European Space Agency's Materials Science Laboratory indefinitely for ongoing materials science research.

*See **Insert** on page 3*

Marshall technology

Two companies successfully commercialize friction stir welding

by Jonathan Baggs

Two companies have successfully commercialized a specialized welding tool developed at the Marshall Center.

Commercialization of auto-adjustable pin tool technology – used in the friction stir welding process – marks another success for NASA's technology transfer program. The program seeks to stimulate broad use of NASA-developed technologies by American private enterprise.

Friction stir welding uses the high rotational speed of a tool and the resulting frictional heat created from contact to crush, "stir" together, and forge a bond between two metal alloys. The technique is more reliable and maintains higher material properties than conventional welding methods. However, friction stir welding has had a major drawback –

*See **Welding** on page 4*

Inside the Star

Marshall's Bob Goss appointed to Senior Executive Service

by Martin Burkey

Bob Goss, chief engineer of the Flight Projects Directorate at the Marshall Center has been appointed to the government Senior Executive Service.

Key Personnel Announcement

As chief engineer, Goss is responsible for the technical success of several key Marshall Center projects, including the International Space Station, Space Station Environmental Control and Life Support Systems, Space Station Node modules, Multi Purpose Logistics Module, Lightweight Multi-Purpose Experiment Support Structure Carrier, and EXPRESS payload racks for the Space Station. He also oversees various advanced projects still under study, including solar power electrical stations in orbit that would provide power to the Earth by using microwave transmission.

The Senior Executive Service is the personnel system that covers most of the top managerial, supervisory and policy positions in the executive branch of the federal government.

Goss came to NASA for the reasons many have — a fascination with the space program and an intense curiosity about how things work.

"In third grade, I was very interested in rockets and missiles and test pilots, as were a lot of other boys in the mid to late 1950s," he said. "Three of us started to get interested, and we were always looking for an opportunity to give a report to the class about things like breaking the sound barrier and rocket planes. I was good at math and science and decided to be an engineer."

Goss began his NASA career in 1966 as a Cooperative Education Program student in Marshall Center's Aero-Astrodynamics Laboratory. After graduating from college, he returned to Marshall in 1970 in the Analytical Aerodynamic Design Branch, where he worked on Space Shuttle designs and other studies.

One of his most rewarding efforts was the development of a makeshift blanket to shield the Skylab space station from the Sun after its own shield was accidentally ripped off during launch. Goss' job was to calculate the effect of the Apollo spacecraft's steering thrusters on the paper-thin shielding of the makeshift blanket.

"I have a lot of curiosity about a lot of things in nature, physics and chemistry," said Goss, recalling the challenges during his career. "I get a lot of satisfaction about solving problems and helping people solve problems."

Throughout the 1970s and '80s, he worked on a variety of projects, such as heavy-lift launch vehicles, space power generation, orbital transfer vehicles, and space robotic servicing. Goss worked in the Space Station Project Office from 1985 to 1989, and then became mission chief engineer for the Spacelab-J science mission aboard the Space Shuttle. Since that flight, he has held increasingly challenging jobs in the Chief Engineer Office, leading to his selection as chief engineer of the Flight Projects Directorate in 1997 and his leading technical role in the Space Station program.

Bob Goss

"The biggest technical challenge of the Space Station program is the "tremendous number of interfaces you have to understand and making sure you meet all the requirements of those interfaces," Goss said. "You have to be careful your design is safe, as well as successful."

Goss is a native of Fort Myers, Fla. He holds a bachelor's degree in aerospace engineering from the Georgia Institute of Technology in Atlanta. He has completed numerous executive and management-level training courses and has received several awards, including the Silver Snoopy Award and the NASA Exceptional Achievement Medal.

Goss and his wife, Rose Ann, who works in the Marshall comptroller's office, live in Huntsville. He is a member of the American Institute of Aeronautics and Astronautics and is a volunteer with Technology Assistance For Special Consumers and the Huntsville Track Club.

The writer, employed by ASRI, supports the Media Relations Department.

Letter to the editor

Note of thanks

The National Contract Management Association-Huntsville Chapter wishes to extend its sincere appreciation to the following corporate contributors who participated in the recent Toys for Tots Drive on behalf of the U.S. Marine Corps Reserve:

Computer Sciences Corp.
Morgan Research Corp.
CST, Inc.
Pace & Waite, Inc.
Gray Research
Sigmatech, Inc.
Intergraph Government Solutions
Sparta, Inc.
Mevatec Corp.
SRS Technologies
Tec-Masters, Inc.

Insert

Continued from page 1

When launched and installed on the Space Station, the Materials Science Research Rack-1 — which is being built in-house at Marshall — will provide unique capabilities for research that do not currently exist onboard the Space Station.

Within the Materials Science Laboratory experiment module will be the Quench Module Insert, one of numerous planned materials processing furnace inserts.

"We recently assembled the Quench Module Insert bread-board furnace and have been processing samples in contractor-developed Sample Ampoule Cartridge Assemblies," said Fred Kroeger, lead systems engineer for the insert. "We have been processing pure aluminum samples at 900 degrees Celsius. Test results affirm that the insert furnace is meeting or exceeding all science requirements.

"We also are building the first flight-like unit in the shop in Bldg. 4705 and expect delivery at the end of March," Kroeger said. "This first unit, the ground unit, will be tested at Marshall, then sent to the European Space Agency's contractor, Astrium, in Friedrichshafen, Germany, for integration and testing with the Materials Science Laboratory." The laboratory provides the power, cooling and control required to operate the insert and the other planned furnace inserts.

"Research Rack-1 will have capabilities that surpass what is currently on the U.S. segment of the Space Station," said Dinah Higgins, project manager for Rack-1. "It is adaptable for many types of experiment modules. It was developed for modular experiments because they are easier to install and replace in orbit. Once an experiment is finished, the astronauts can just remove the module and replace it with the next scheduled module."

The Quench Module Insert, one of a new generation of materials processing furnaces, replaces older systems such as the Advanced Automated Directional Solidification Furnace. The Quench Module Insert is not only lighter — 55 pounds vs. several hundred pounds — but also uses less energy to operate — 200 watts vs. 2,500 watts of power. It can provide a temperature gradient of 150 degrees Celsius per centimeter, which translates to a change in temperature of more than 760 degrees Fahrenheit per inch.

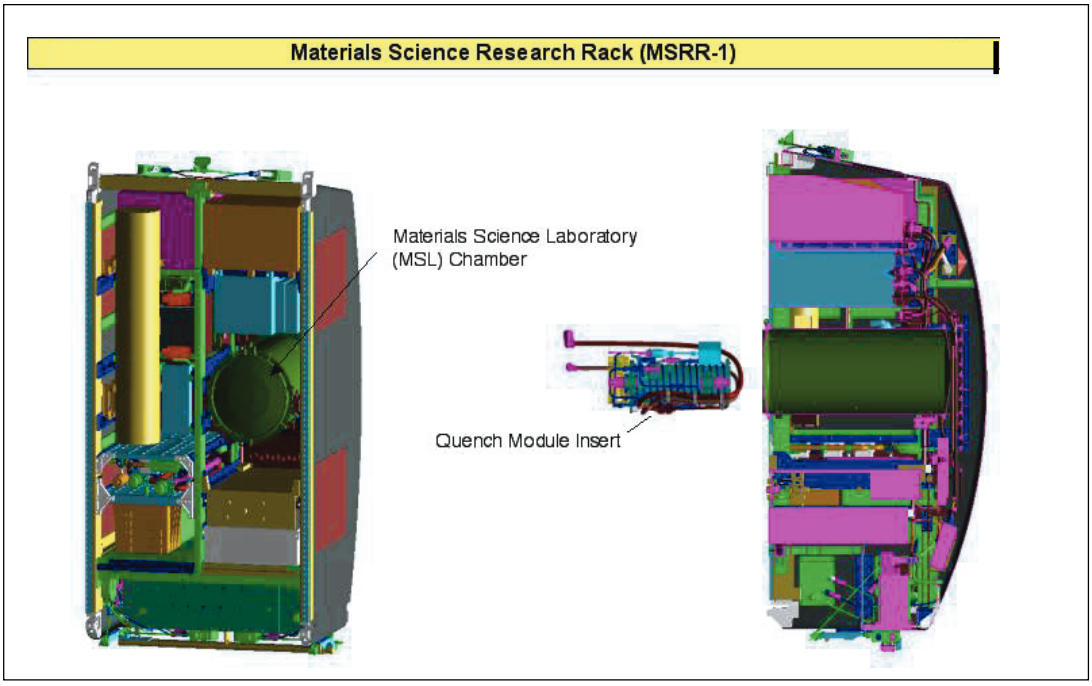
The Quench Module Insert is capable of operating at temperatures of 1400 degrees Celsius (about 2,550 degrees Fahrenheit) for extended periods of time, a very difficult technical challenge, making it one of the most sophisticated and technologically advanced furnaces in the world.

These capabilities are important to scientists who will use the insert to process a variety of samples, including aluminum alloys. The high temperatures and high-temperature gradients provided by this furnace will enable researchers to perform fundamental materials science research that can only be carried out in space.

"The research carried out on the Space Station will give scientists better insight into the fundamentals of processing many types of materials," said Dr. Bill Carswell, a senior research scientist at UAH and project scientist for the Quench Module Insert.

"The results of Space Shuttle research have already been used to improve metallurgical foundry yields here on Earth, and it is anticipated that the Space Station experiments will yield even more results to further improve those and other processors," Carswell said.

The writer, employed by ASRI, is the Marshall Star editor.



Marshall Association inducts new officers for 2002

The Marshall Association recently inducted new officers for 2002.

Those officers are Byron Butler (PS01), president; Chip Jones (ED33), vice president for programs; Marie Malone (SD31), vice-president for communications; and Cliff Bailey (AD01), secretary/treasurer.


Byron Butler


Chip Jones


Marie Malone


Cliff Bailey

"Our new officers are outlining the planned luncheon meetings/programs for the coming year and are leading a membership drive," Butler said. "New 2002 membership cards will be provided soon."

The Marshall Association provides an open, creative and stimulating forum for the exchange of ideas and information.

"The Marshall Association, in 2002, promises to again provide interesting luncheon speakers, great opportunities for learning, and fellowship with co-workers," said Center Director Art Stephenson. "I would like to encourage our Marshall family to make this a successful year by rising to the occasion and joining the 2002 Marshall Association. With teamwork, we can significantly increase the membership goal and continue to sponsor the two scholarships for dependents of Marshall civil service employees."

Membership in the association is open to all current and former Marshall civil service employees. Membership dues are $25 per year and should be sent to AD01/Cliff Bailey.

Welding

Continued from page 1

reliance on a single-piece pin tool. The pin is slowly plunged into the joint between two materials to be welded and rotated at high speed. At the end of the weld, the single-piece pin tool is retracted and leaves a "keyhole," something which is unacceptable when welding cylindrical objects such as drums, pipes and storage tanks. Another drawback is the requirement for different-length pin tools when welding materials of varying thickness.

To overcome these drawbacks, a Marshall Center welding engineer helped design an automatic retractable pin tool that uses a computer-controlled motor to automatically retract the pin into the shoulder of the tool at the end of the weld — preventing keyholes. This design allows the pin angle and length to be adjusted for changes in material thickness and results in a smooth hole closure at the end of the weld.

MTS Systems Corp., a leading supplier of mechanical testing and simulation equipment based in Eden Prairie, Minn., recently introduced an advanced friction stir welding process system employing Marshall's retractable pin tool technology. Use of the tool by MTS has resulted in applications that are cost-competitive, efficient and versatile for automotive, shipbuilding and other industries. This Marshall technology also has helped the company gain market share in the growing friction stir welding niche and develop additional business relationships.

Another company, MCE Technologies, Inc., (MCETEC) of Seattle, has developed a cutting-edge line of production stir welding equipment that uses Marshall's retractable pin tool technology to provide flawless welds in high performance aluminum alloys, including those previously thought unweldable. The company's use of the retractable pin tool has contributed to production advantages including minimal material distortion, lack of contamination and greater joint strength for friction stir welding applications in aerospace and other industries. Additionally, working with the Marshall Center has helped MCETEC remain a stable employer by improving its product offering to the friction stir welding market.

Applications for friction stir welding include aircraft, aerospace, marine shipbuilding and decks for car ferries, trucking, railroading and assembling large tank structures such as fuel tanks and radioactive waste containers.

Benefits of friction stir welding, using the Marshall Center's retractable pin tool technology, include:

- Diverse materials: Welds a wide range of alloys, including previously unweldable and composite materials.
- Durable joints: Provides twice the fatigue resistance of fusion welds and no keyholes.
- Retention of material properties: Minimizes material distortion.
- Safe operation: Does not create hazards such as welding fumes, radiation, high voltage, liquid metals or arcing.
- No keyholes: Pin is retracted automatically at end of weld.
- Tapered-thickness weld joints: Pin maintains full penetration.

For more information on NASA and the Marshall Center's technology transfer program, visit the Web site: *www.nasasolutions.com*

The writer, employed by ASRI, supports the Media Relations Department.

OPM to e-mail science and engineering surveys

from the Human Resources Department

Within the next two weeks, approximately 400 scientists and engineers at the Marshall Center should be receiving a survey from the U.S. Office of Personnel Management (OPM) as part of a government-wide study of scientific and engineering occupations.

This survey was originally scheduled for September 2001. However, delays at OPM required rescheduling for January 2002.

All federal agencies will receive the same survey forms. The survey forms distributed to NASA employees will not be the traditional paper surveys that will go to most other agencies, however. NASA employees will receive an e-mail message directing them to a Web site where they will be able to complete the survey electronically.

The data collected from this survey will help OPM revise and update position classification and qualification standards for scientific and engineering positions. The data also will be shared with members of NASA's AST Working Group who are revising and updating NASA's AST Classification Index. It is, therefore, very important that each survey be accurately completed.

Employees will receive either a "tasks" survey or a "competencies" survey. They will not receive both. The surveys for non-supervisory engineers and scientists will take about an hour to complete. Surveys going to supervisors will take slightly more than an hour. All responses are anonymous and will go directly to OPM electronically.

Bringing Marshall technology to you

Interactive displays inform public about accomplishments

by John Limperis

If you've ever questioned how the American public benefits from the U.S. space program, the Marshall Center has your answer. And it could be as close as the local shopping mall.

To better acquaint the public, industry, academia and legislators with products developed with space technology and incubated at the Marshall Center, multi-media display units are being placed in high traffic locations in North Alabama.

The first four units are slated for three Madison County, locations: Bldg. 4200 at Marshall, Madison Square Mall, the Huntsville International Airport, and the Birmingham International Airport. Plans are under way to deliver additional units for placement throughout the United States.

The units were developed by Exodus Technology Corporation of Huntsville under contract to Marshall's Technology Transfer Department. The sleek stainless steel-skinned units feature touch screens and provide the user a variety of multi-media stories ranging from now familiar technology like cordless power tools, CAT scans and video stabilization, to future advances in health care and environmental control. The story scripts are carefully crafted to appeal to a wide audience and variety of ages.

The project intends to promote thought-provoking experiences for all segments of the American public, while informing them of the benefits they've received from their investment in NASA.

"We are very excited about our association with Marshall's Technology Transfer Outreach efforts and having the opportunity to manage the development and delivery of such high profile systems to help inform the general public of contributions made to the community at large with technology developed at NASA," said Jacquelene Reid, president and chief executive officer of Exodus. "We want to generate excitement and interest in all the technological advances resulting from the space program that has significantly improved life for the general population."

Photo by Doug Stoffer, NASA/Marshall Space Flight Center

Conrad Ahia, an employee with ODIN, checks out the new multi-media display in the lobby of Bldg. 4200

Reid's company will manage the software and hardware development, graphics, text, video, animation, sound presentations, metrics, logistics, remote, delivery and maintenance of the first wave of the multi-media display units.

"Now, more than ever, it's important for all of us to understand how our space program keeps the United States at the forefront of technology development and how it directly benefits our country," said Vernotto McMillan, manager of the Technology Transfer Department. "That idea is well summed up by the slogan our office uses, 'The technologies we need to reach the stars are the engines that drive America's future'."

The writer is a technical liaison employed by Pace & Waite.

Energy tip

Increase savings by cutting dishwashing energy costs

With a few easy steps, households can cut dishwashing energy costs. Most of the energy used by a dishwasher is to heat the water.

• Check the dishwasher's manual for recommendations on water temperature; many have internal heating elements that allow setting the water heater in the home to a lower temperature (115 degrees Fahrenheit).

• Scrape, don't rinse, off plates; soaking or prewashing is generally only recommended in cases of burned-on or dried-on food. Be sure the dishwasher is full, but not overloaded.

• Let dishes air dry, and don't use the "rinse hold" setting on the machine for just a few soiled dishes; it uses three to seven gallons of hot water each time it is used.

• When shopping for a new dishwasher, look for the Energy Star label.

For more information on other ways to save energy at home, visit:
http://www.eren.doe.gov/energy_savers/.

If you have an energy tip that you would like to share with the "Marshall Star" readers, send it to:
cedreck.davis@msfc.nasa.gov or
juergen.haukohl@msfc.nasa.gov

Public Inquiries office moves to Bldg. 4200

When people need information about NASA or the Marshall Center, one of the places they go to get that information is Marshall's Public Inquiries office.

Until recently, that office, which is part of the Government and Community Relations Department, was located on the first floor in Bldg. 4203. In December 2001, the office, staffed by Ai Signal Research Inc. employees Carrie David and James Turner, moved to the first floor of Bldg. 4200, room 120.

"We relocated to Bldg. 4200 to make room for office space for the Space Launch Initiative," said Judi Hollingsworth of the Government and Community Relations Office. "We're very excited about our new location, which is close to where the Heritage Gallery will be once that move is complete. We feel that being close to the Heritage Gallery will make the Public Inquiries office more accessible to people looking for information about Marshall programs and NASA."

Public Inquiries handles various forms of outreach for the Marshall Center — free to employees and to the public. This outreach includes providing information and supporting special events such as Space Week.

Photo by Doug Stoffer, NASA/Marshall Space Flight Center

James Turner, left, checks pamphlets on the shelves while Carrie David, center, assists Clayton Pitts of Tec-Masters Inc. in his selection of NASA and Marshall Center information.

"We receive letters, e-mails and phone calls — both foreign and domestic — from children and adults, requesting information about NASA and the Marshall Center," said David. "We provide the information requested or direct them to the appropriate office or Web site where the information can be found."

Each year, Public Inquiries responds to nearly 5,000 requests for information.

"Our most popular requested items are lithographs, current launch information, stickers and posters," said Turner. "We also have technology briefs, press kits, fact sheets, NASA coloring books, program information and educational information on planets and space."

For more information about Public Inquiries, call 544-3037 or 544-8516.

VISAR in TV feature

At 8 p.m. Saturday, on "America's Most Wanted," Fox 54 is expected to air a segment about Video Imaging Stabilization and Registration (VISAR) — a video stabilizing technology developed at the Marshall Center by Dr. David Hathaway and Paul Meyer of the National Space Science and Technology Center.

Volunteers needed

Volunteers are needed to serve on the committee planning activities for Marshall's annual "Take Our Children to Work" day April 25. Volunteers will meet from 1-2:30 p.m. Jan. 29 in Bldg. 4200, room 715. For details, call Billie Swinford in the Equal Opportunity Office at 544-0087.

Marshall Volunteer Program

The Government and Community Relations Department will hold a meeting at 10 a.m. Jan. 31 in Bldg. 4200, room P110, for civil servants and contractors interested in helping local charities and non-profit organizations. Marshall's Volunteer Program will work with the Volunteer Center on this effort. For more information, call Vanessa Lindsey at 544-5663.

S&RC IMAX policy

The U.S. Space & Rocket Center's IMAX presentation policy for Marshall civil servants and retirees has changed from free admission to half off the regular admission price for civil servants and immediate family members — spouse and dependent children under 21 who are living at home. Civil servants and retirees still have free access to the museum, bus tour, simulators and gift shops. For details, call Cassandra Pitts in the Government and Community Relations Department at 544-4577.

Mentors needed

SHARP mentors — The Education Programs Department is initiating the 2002 Summer High School Apprenticeship Research Program (SHARP). SHARP is an eight-week paid apprenticeship for high school students who reside within commuting distance to a NASA field installation. Marshall will be placing nearly two dozen students and will need mentors for each one. If interested, call Alicia Beam at 544-2849.

Summer Intern Program mentors — The Equal Opportunity Office's 2002 Summer Internship Program will be May 20-July 26. Approximately 77 students will need mentors from the technical directorates. If interested, call Madeline Hereford at 544-7420.

Spot bid sale

A drop-by spot bid sale will be held from 9 a.m.-2 p.m. Feb. 13 at Intergraph Bldg. 21. The sale will consist of 40 personal computers (no Macs), 6 laptop computers (no Macs) and 14 lots of assorted furniture. For details, call Greg Tate at 544-1774.

Upcoming classes

For a complete list of training opportunities at the Marshall Center, visit the "Inside Marshall" Web site.

Clubs and Meetings

ASEM meets

The American Society for Engineering Management (ASEM) will tour ADTRAN Inc. at its next meeting from 11:30 a.m.-2:30 p.m. Jan. 29 at ADTRAN on Bradford Road West. Attendees can purchase meals in the cafeteria. There will be a short meeting and awards presentation. For more information, call Kenneth Sullivan at 313-6172.

Shuttle Buddies meet

The Shuttle Buddies will meet for breakfast at 9 a.m. Jan. 28 at Mullins Restaurant on Andrew Jackson Way. For more information, call Deemer Self at 881-7757 or Gail Wynn at 852-8189.

Instrumentation Division meets

The Measuring Branch, Telemetry Branch and Radio Frequency Branch meet the first Tuesday of each month at 11 a.m. at the Redstone Golf Club Coffee Shop. For more information, call Tom Escue at (256) 232-1549.

NASA Exchange

Valentine dance

The MARS Ballroom Dance Club Valentine Dinner Dance will be held from 6:30-11 p.m. Feb. 9 at the East Exhibit Hall in the Von Braun Center. Music will be by the Little Big Band. Attire is semi-formal. Admission is $20 for members, $25 for guests. For tickets, call Linda Kinney at 544-0563, Woody Bombara at 650-0200, Bob Williams at 544-3998, Hugo Berry at 544-3525, Pat Sage at 544-5427, Palmer Herndon at 534-7408, or Tami Landers at 544-6818.

Community Chorus

The Huntsville Community Chorus Association's final concerts for the 2001/2002 season will be at 2 and 7:30 p.m. Feb. 9 at the Huntsville High School Auditorium. NASA employees, retirees and contractors can receive a 10 percent. For more information, call 533-6606.

Shoe Carnival discount

NASA employees, retirees and contractors can receive a 40 percent discount off the sticker price of any purchase by showing their NASA badge at either Shoe Carnival store Jan. 25-27. For more information, call Candy Bailey at 544-7565.

Job Opportunity

Announcement # MS02C0021: Management Support Assistant (OA), GS-303-07, Employee and Organizational Development Department. Closes Jan. 31.

Employee Ads

Miscellaneous

★ Italian champagne bucket, black glass "top hat", $35; silver overlay plates, servers, $15 each. 882-6832
★ Dark walnut RCA ColorTrak console TV, 27", you pick up, $200. 895-0462
★ Remington 700AD, 170 caliber rifle, Simmons 44 Mag scope, 3.10x44, $400. 232-6881
★ Dell laptop computer Pentium 3, 600 Mhz, floppy, CD, and Zip drives, two batteries & carry bag included, $835. (256) 539-9777
★ Four tickets each Daytona 500, Feb. 17 and GNC Live Well 300, Feb 16, Row 44, Lund Tower, backstretch, face value. 772-8718
★ Whirlpool dryer, white, $100. 971-9710
★ Mac Powerbook laptop G3, 233 MHz, 256MB RAM, 20GB HD, 14" screen w/ DVD, CD-R, zip, printer, OS 9.1, MS Office 98, $500. 881-7750
★ Executive leather desk chair, roll around with high back and swivel, $75. 426-0871
★ Corona kerosene heater, 22,600 btu/hr. $65. 533-5942
★ 1990 Evinrude, 8hp, $500; 1992 Johnson, 20hp, $975. 536-9521/656-5026
★ Lazy Boy living room sofa, floral pattern, mauves/pinks, blues, greens, $300. 534-7981
★ Utility trailer, flat bed, 10'x5', $475 or will trade for a good canoe. 922-9294
★ Full size inner-spring Futon with cover, $350. 256-880-7172
★ Vans brown suede skate shoes, boy's, size 2, new, $15; K2 Reflex black inline soft-boot skates, men's size 9, new, $65. 533-5942
★ Klipsch/Sony complete home theater, $2,500 obo. 647-4949
★ Kenwood 5-way stereo speakers, $90 each; Dell 486-66 PC w/14" monitor, 1.5gig HD, CD, 32meg RAM, monitor, software games, $75 obo. 881-8674
★ Firewood, $40 per rick. 379-2020 after 4 p.m.
★ Radio-controlled airplane, engine and 8-channel Futaba 8USAF radio, $350. 527-5247
★ Persian hand woven rug, imported from Kashan, 8'x12', emaculate design, $2,500 obo. 880-2295

Vehicles

★ 1999 Chevy Silverado Z71, extended cab, 36K miles, extended warranty, $19,500. (256) 757-2850
★ 1997 Dodge RAM 1500, 4x4, extended cab, 106K miles, $11,500 obo. (256) 828-5260
★ 1999 Dodge HD Quad cab, 24V Cummins, 3/4-ton truck, 5-speed, 37K miles, toolbox, running boards, $22,900. (256) 232-1418
★ 1995 Ford Contour GL, 4-cyl., auto, keyless, white/blue interior, 48K miles, garaged, $4,675. 883-6284
★ 1998 Dodge Grand Caravan SE, $9,900. 233-6197/564-6225 beeper
★ 1993 Dodge Caravan SE, one-owner, service records available, $3,995. 895-9520
★ 1997 Nissan Altima, red/gray interior, 86K miles, $7,500. 534-6453
★ 1996 Kia Sephia, one-owner, black, 60K miles, safety airbags and rear locks, a/c, AM/FM cassette, $4,000 firm. 955-2345
★ 1994 Nissan Quest GXE mini-van, 142K miles, 7-passenger, CD, power w/d, alloy wheels, cruise, $6,500. 464-3130
★ 2001 Cadillac Sedan Deville, diamond white, leather, heated seats, alloy wheels, power, $30,995 obo. 232-1549
★ 1995 Camaro, purple, T-tops, 16" concept neper wheels, flowmaster, tips, all-power, 168K miles, $5,900. 837-6041
★ 1989 Volvo 740 Turbo wagon, white, 3rd seat, 165K miles, $4,900. 534-2623
★ 1997 Nissan Maxima SE, green/beige leather interior, auto, new tires, 65K miles, $11,700. 232-1940
★ 1999 Toyota Avalon XL, sunroof, CD/cassette, leather, alum/alloy wheels, side airbags, champagne, 56K miles, $18,700. 880-9025
★ 2000 Mercury Grand Marquis, silver w/gray interior, 47K miles, 75K warranty, non-smoker. (256) 729-6188
★ 1998 Dodge Grand Caravan, P44, $9,900. 233-6197/564-6225 beeper
★ 1995 Ford Econoline E-150 van, V-8, auto, power, a/c, white, 87K miles, one-owner, $6,000. 772-3629

Found

★ Frank Sinatra CD in South Parking Lot, Bldg. 4200. 544-3037

Wanted

★ Washer and dryer in good condition. 852-4406
★ Twin mattress and box springs/foundation in good condition. 721-4928/233-7531
★ Tall antique pie safe with punched-tin panels and doors, preferably not painted. 774-3467
★ Toyota Camry, Honda Accord, or Honda Civic, 96-98, automatic, less than 75K miles, good condition. 883-2757

Free

★ Two-year old male Sheltie, AKC registered, shots current. (256) 498-5332
★ Yellow lab/hunting dog mix, 2 yrs. old; kitten, 3 months old. 828-7382
★ Declawed Siamese cat, must stay indoors, good w/dogs, not good w/small children. (256) 753-2278

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